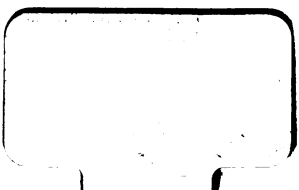

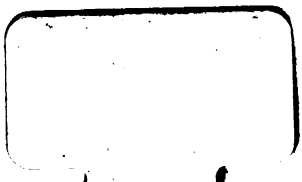

A LETTER TO *WILLIAM HOOSON*, A DERBYSHIRE Miner.

SHEWING

16 **DIALECT.** LINDEN (Diederick Wessel) A LETTER ... WILLIAM HOOSON, a Derbyshire Miner. Shewing the Mistakes a Er...s, committed in his lately publish'd Miners (*sic*) Dictionary. Witl Preface setting forth the Reasons for making the said publick. Sm. 8 **first edition,** a few leaves at end stained, wrapper. 15/-

Elizabeth Adams for J. Page: Chester 17

*** British Museum General Catalogue, "L," XL., 1. VERY RARE. Not Cooke (John H.), *Bibliotheca Cestriensis*, or Agassiz.

PREFACE

Setting forth the

REASONS for making the said publick.

By *Diederick Weſſel Linden*, M. D.

CHESTER:

Printed by ELIZ. ADAMS, and sold by J. PAGE, Bookseller, in *Bridge-Street*; and by JOSEPH GITTINS in *Holywell*. 1747.

[*Price One Shilling.*]

PREFACE.

AS Mr. *Hooſon* has ſet off his Book (which in a great Meaſure has been the Occaſion for theſe Sheets) with a *Preface* to his gentle Readers, lamenting the great Want there is of a *Treatiſe of Mining*; which indeed, he has ſufficient Reaſon for: So, I ſuppoſe, ſomething of the ſame Nature will be expected from me; and indeed, upon my Peruſal of them, have found it incumbent upon me, by way of Apology for the Harſhneſs of my Style, to ſet forth the Motives that have induc'd me to make this publick, tho' I have interſpers'd them here and there in my Letter.

Mr. *Hooſon* ſays, that he never found a Book in the *Engliſh* Tongue uſeful to Miners, and therefore has compiled his Treatiſe, in order to provoke ſome abler Hand to undertake ſo

uſeful a Work. In this he may be ſincere; but if he is, he has gone the wrong way to Work; he has over-acted the Part of one endeavouring to promote the Improvement of an Art by denying Matters of Fact, and ſeemingly turning to Ridicule the very Ground-works and Pillars of Mining; which the longer you are getting acquainted with, the greater will be your Loſſes. This Reflection, with that of my having received a great many Civilities from Numbers of Gentlemen in this Country, has excited my Compaſſion, and cauſed me to ſet my Pen to work, to adviſe them to a further and deeper Search into thoſe Myſteries of Nature, by which, I hope, ſome Steps will be gained towards the bringing to Perfection this Art; which is the Way, that not only our Predeceſſors for many Ages have gone to Work, but likewiſe what my Countrymen do at preſent, to their no ſmall Emolument and Advantage: For 'tis not the idle Abettor of Ignorance, but the Curious, the Inquiſitive: 'Tis not he, that goes upon Hypotheſes, but he that backs his Reaſon by a

Series

Series of Experiments: 'Tis not he, that tir'd by the Unſucceſsfulneſs of them, denies the Thing to be poſſible to be found out; but he, that frankly communicates to the World how far he has gone towards making the Diſcovery, and leaves, and humbly ſubmits the reſt to the Abilities of his Succeſſors, that is the Promoter of Sciences.

I DON'T pretend to be endued with any particular Abilities, or to have a more than ordinary Knowledge in this noble Art; but I confidently believe, that I have as much in Manuſcripts, as I have learn'd and acquir'd in other Parts of the World, as would be of ſingular Service both in Mining and Smelting in theſe Iſlands: But as I in no ways lie under any Obligations to the Publick, but only indebted to ſome few worthy private Friends, I think myſelf in Duty bound to ſerve myſelf and them firſt; and that conſidering the ill Uſage I have met with, and the various Affronts I have received in *England*, I am the more readily to be excus'd from this publick Service, which has been ſo great, that

that I can ſcarce judge otherwiſe, than that Envy, Spleen, and Ill Nature have taken up their Head-Quarters in theſe Iſlands.

EVEN here in this little Place, where I have taken all the Pains imaginable without Fee or Reward, to ſerve both Rich and Poor, I find I am under the Laſh and Cenſure of ſome idle People, who have nothing elſe to do, but to vent their Spleen and Malice in Letters ſent to *London* concerning me; in ſome of which I am ſtyl'd a Mountebank, in others, as one come to cheat the Country: But as theſe their Conjectures are founded upon a very rotten Baſis, proceeding only from their diſtemper'd Minds, I cannot help telling them, that they have afforded me no ſmall Satisfaction; for their Letters have fallen into my Hands, and perhaps ſometime or other they will have Occaſion to repent of what they have done, let them at preſent look upon me as inſignificant as they pleaſe.

SENTIMENTS are the true Symptoms of our Inclinations; ſo that if a Man cannot judge with Generoſity of his Fellow-Creature, when

when he has not ſufficient Reaſon on his Side for the contrary, it is a true Sign, that, had he it in his Power, he would put his evil Inclinations into Execution: And for ſuch a Perſon I have a real Compaſſion, as his Life muſt be a Burthen to him, whilſt on the other Hand the generous Man lives in a conſtant Paradiſe.

THIS may be thought full enough for a Preface; but before I conclude, muſt beg of Mr. *Hooſon*, to excuſe the Warmth and Heat of my Style; which I hope he will, when he reflects upon the above-mention'd Provocations I have had to ruffle my Temper, as I doubt not, but he is ſenſible how far the Paſſions of the Mind are capable of altering it. I muſt alſo deſire the Readers not to imagine, that I here conclude or infer, that the Whole of this Nation acts out of the Road of Civility and Common Senſe; let them take it to themſelves, to whom it only ſuits. I muſt likewiſe beg they will overlook ſome Errors that I may have been guilty of, becauſe whilſt I am writing with my

my Right Hand, I feel the Pains of my Left, occaſion'd by my late Misfortune of having broke it; upon which Account I ſhall expect their Indulgence in not having ſufficiently revis'd and corrected them. I muſt likewiſe, as I think myſelf in Duty bound, inform them, that I am indebted to my worthy Friend, Mr. *Thomas Cotham*, *Medicin. Candid.* whoſe Abilities in the principal Branches of Phyſick I greatly admire, for the *Engliſh* that I have produced; for ſuch, as I am a Foreigner, cannot be expected from me; and with this I'll conclude my perhaps too long Preface for ſo ſhort a Letter.

Holywell, April
16. 1747.

A

LETTER

TO

William Hooſon, &c.

SIR,

YOUR Book, the MINER'S DICTIONARY, was yeſterday handed to me by one of your Subſcribers, and upon my Peruſal of the Title Page, which naturally led me to view the Largeneſs of the Book itſelf, I confeſs I was not a little amaz'd, thinking it impoſſible, that thoſe few Sheets ſhould comprehend all, that I ſaw there promiſed, when other more experienc'd Miners, and far better Theoriſts have not been able to do as much in their three or four moderate Volumes in *Quarto*: However, I ſoon judg'd you were not ignorant of the common Saying, *viz.* That a good Title Page makes a Book ſell well; and if there are either a Sett of People that buy Books for an Ornament only

to their Libraries, or others, that will take for granted what they ſee in Print, and thoſe in a ſufficient Number, you will gain your Ends, and your Bookſeller will not be a Loſer by you. Now I really believe you have ſuppoſed ſuch, otherwiſe you would not have impos'd upon the World a Contradiction to your Title Page in ſo groſs an Error, as what I found under your Section of Veins in theſe Words, *That no Man can know the Nature of a Vein, as to its Sides, Soil, and the Ore itſelf, and what other Concomitants, that may attend it, to vary, or alter the Property of it, for the better or worſe, 'till by Workmanſhip made therein, he ſees the Nature of it. Credat Judæus apella.* But if this be ſo, pray how have you fulfilled your Promiſe, to inſtruct a Gentleman, how he may know whether he has Mines in his Land, or not? What Knowledge can he reap? What Inſtruction will he receive, if he can't know the Quality of his Vein without ripping open the Bowels of his Land? Every common Miner here is already rivetted in that Opinion; and if your Knowledge extends no further than theirs, you might as well have been ſilent, as you have only left this uſeful Art upon the ſame Footing, even in theſe Parts, as it was before the Publication of your Book.

However, I'll venture to pronounce you miſtaken; the Art of Mining is arriv'd to a far greater Certainty than you imagine; 'tis not

not built upon ſuch idle Hypotheſes as you lay down, for the Comfort of your candid Readers (for where is there the *Alexander*, unleſs he be a *Craſſus* too, that will ſtruggle againſt ſuch Uncertainties) I ſay, for their Comfort, I will as poſitively affirm, as you have the contrary, that there are thoſe, that will tell the Nature of any Vein whatſoever, before they work it; nay, what is more, no one can pretend to underſtand his Buſineſs, unleſs he can do it; but you know it not, as much as you boaſt of your forty Years Experience: And excuſe me, if I don't inſtruct you in this uſeful Diſcovery; let thoſe reap the Advantage of it firſt, that have made it. Pardon likewiſe my Severity, 'tis my natural Love for Mankind, that prompts me to it: Who can bear to ſee an avouch'd Ignorance, endeavouring to caſt a Veil over certain known Truths, and be ſilent? when upon them not only the Perfection, but even the Preſervation of this Art depends. But I have Chriſtianity enough to think, you did not know the Crime you were guilty of; you did not foreſee the fatal Conſequence that might attend your Aſſertion; you was not aware, that it tended to prevent the young curious Enquirer to reach to that Summit of Knowledge, which ſome other Parts of the World has ſometime ſince attain'd to. I have likewiſe Humanity enough to own, your Book might have had its Uſe, and been of Service to the young

Proficients in Mining, had you judg'd right, and confin'd it to a Dictionary ſolely, and Explanation of the Tools and Technical Terms of Art, which in this Part of the World are in Uſe, without touching upon the Theoretical Part, as I ſee you are entirely ignorant of the Foundation of it; but you have made the old Proverb good, *Non omnes, qui Citharam tenent, Citharedi ſunt. Many talk of* Robin Hood, *who never ſhot in his Bow.* In fine, in as brief a manner as poſſible, I'll acquaint you of it, and point out the Loſſes you have, and daily do ſuſtain, for Want of it; and if after theſe my Endeavours, *Populus vult decipi, decipiatur.*

The Art of Mining is founded upon a Chain of Experiments, grounded upon Reaſon, collected in ſeveral Ages, and preſerv'd down to this Time: So that if an unhappy Period ſhould be once put to this Chain of Enquiry, then the Mines in other Parts of the World muſt come to be managed by a Parcel of Impoſtors, as they are in *Wales*, and conſequently ſhare the ſame Fate with theirs; that is, the diſcover'd Veins will in a ſhort Term of Years be loſt: And this my Opinion I could ſupport with a great many undeniable Facts, had I Time and Leiſure to enlarge this Letter.

From the Obſervations I have made in regard to the Method of Mining of this Country, I plainly ſee, that this noble Art here

here is but yet in its Infancy; and if they don't ſoon put their Hands and Heads to work for its Improvement, they themſelves and their Poſterity will repent of it. As for my Part, I am aſtoniſh'd to find them ſo idle on this Subject, when they daily ſee how ſoon the richeſt Mines, in their Miner's Opinion, are exhauſted, or as they term it, work'd out; witneſs Sir *George Wynne*, Baronet's great Mine at *Halkin*, where, I am confident, they have not yet got the twentieth Part of this great Trunk of Ore, and yet you ſee it's loſt; and I can ſafely ſay, loſt for want of a due Knowledge in Mining.

We have Mines in *Germany*, that have been work'd theſe ſeven hundred Years and upwards; but had not my Countrymen been as induſtrious in improving every new Diſcovery, as you for Indolence-ſake are ready to deny them, our Mines would then have ſuffer'd the ſame Fate as the above-mention'd on *Halkin* Mountain;—but enough on this Subject.

In the following Paragraph you freely give us your Opinion of the *Virgula Divinatoria*, and no doubt on't, you were highly pleas'd with it, as you had no leſs a Perſon than the Hon. Mr. *Boyle* to quote in ſupport of it; but don't be angry, when I tell you, that neither you, nor Mr. *Boyle*, knew any thing of the Matter: So in Reality, had you remain'd ſilent on that Head, it had been better, as you had not then expos'd your Ignorance,

ignorance. Indeed, you endeavour'd to find it out; and what Pity is it, that your Lucubrations were not at length rewarded with the Poſſeſſion of it! But you conſulted the Stars and Planets about it, (a Study as abſtruſe, as your Method of teaching a Gentlemen how he may know whether he has Mines in his Land, or not) and the Stars deceiv'd you. However, don't infer from thence, that there is no ſuch Thing; but if you do, you muſt not expect that any one will take upon him the Pains and Trouble to convince you to the contrary; 'tis too valuable a Treaſure in the Hands of thoſe that are in Poſſeſſion of it, to be made ſo ſlight of; every one that knows it, will ſerve his Turn with it; but let them take Care, that they don't meet with the ſame Fate, as you ſay, the dignified Inventor did.

In my native Country there is a Chemical Society, that have eſtabliſhed a Fund, out of which they pay Rewards for Diſcoveries made in that noble Science; and when they are at a Loſs how to reſolve any Queſtion, the Preſident of the ſaid Society publiſhes it, proclaiming the Reward for finding out the ſame. I remember very well, when the moſt deeply learned *Doctor Stahl* was Preſident of the above-named Society, he offer'd twenty-five Ducats as a Reward, for any Body that could prove who was the Inventor of the *Virgula Divinatoria*: But I remember no Body there, tho' you ſay he was a *German*,

German, could give any certain Account of him. A thouſand Pities, that this Queſtion was not ſent to *Halkin*, ſince you, I find, was the Oracle, that was able to have informed us, that he was hang'd in *Germany* as a Cheat: You was that bright Genius, that Diver into Antiquity, that could have acquainted us, whether he was ſuſpended on a Gallows, or Gibbet, in Chains, or in a hempen Cord; and I doubt not in the leaſt, but you could have given us a full Account of his Age, Complexion, Name, and Place of Abode: Poor Inventor! that was tuck'd up in Mr. *Hooſon*'s Book, without the leaſt Sign of Compaſſion. However, Sir, if you can prove from good hiſtorical Traditions, that the Author of the ſaid *Virgula Divinatoria* was hang'd, I will immediately pay you the above-mention'd Reward.

I ſhall not take upon me to teach you the *Virgula Divinatoria*, but I'll reaſon a little with you on the Subject, from which (if you'll baniſh Partiality, and Self-conceit) as much may be gather'd, as will make you conclude, that ſuch a Thing, with all the Effects that are attributed to it, poſſibly may exiſt *in rerum Natura*.

Is there a more ſurprizing Thing in Nature, than the Magnet or Loadſtone, which attracts Iron? And is there not the ſame latent Property, the ſame *Vis Energiæ* in it, as is attributed to the *Virgula Divinatoria*? Yes; and what is more, this ſaid Magnet or Loadſtone

Loadſtone is of great and ſingular Uſe in diſcovering Mines, which, tho undeniably true, I am ſure you have never before heard of, otherwiſe you would have ſwell'd your Book into a far greater Chaos of Abſurdity than it is.

You are not ignorant how uſeful a Diſcovery the Magnet was to the Seafaring Perſon; how knowing a Pilot is it? How certain a Guide? And has Divine Providence denied one to the Mineraliſt? His Road is as intricate, and his Path as obſcure, tho' you ſay you have pointed it out; but I have read your Treatiſe, and by it I think, I might as well find out the Longitude as a Lead-Mine. But let not that diſcourage the curious Searcher into the Myſteries of Nature; *querite et invenietis*, ſeek and you ſhall find; the *Vis attrahens* of different Metals will at length afford you a Loadſtone.

Iron itſelf may by Art and length of Time be impregnated with the magnetick Force, and changed into a Loadſtone; as that profound Naturaliſt *Peter Van Muſſchenbroeck* has it in his *Elementa Phyſice*. *Ferrum per ſecula in loco quieto, ſupra Terram poſitum, mutatur in præſtantem Magnetem, Foſſili ſimilem, ſed aliquantum ſpecifice graviorem.* "Iron having lain undiſturbed for Ages up-
"on the Ground, is changed into an excel-
"lent Magnet, like the Foſſil itſelf, but
"ſomewhat ſpecifically heavier." The ſame

is prov'd by an Experiment recorded in the Hiſtory of the Royal Academy, *anno* 1731. *Maſſiliæ in turri alta ea Craſſo ferramento, utrinque a Lapide molli excepto, ſuſpenſam fuiſſe Campanam traditur : ferramentum horizontaliter ab ortu ad occaſum exporrectum, tempore* 420 *annorum jacuerat, accreverat rubiginis ſpecies ad utramque extremitatem : hæc excuſſa egregiam vim Magneticam poſſidebat, extrinſecus formam rubiginis referebat, fracta ſplendentibus partibus, lamellorum modo ſibi impoſitis, duritie non cedentibus Magneti vulgari, conſtat.* " It is ſaid, that at *Marſeilles* a Bell " was hung up in a high Turret upon a " thick Bar of Iron, receiv'd in a ſoft Stone, " and plac'd horizontally from Eaſt to Weſt: " After it had lain 420 Years, it was found, " that a ſort of Ruſt had grown to each " End, which being knock'd off, it had all " the Vertues of a Magnet; outwardly it " ſeem'd like Ruſt of Iron, but being " broke there appear'd ſplendid Lamellæ or " Sheets, in hardneſs not the leaſt inferior " to the common Loadſtone." Now, the Queſtion is, whether other Metals be depriv'd of this Quality? In reality I think not, but believe there's a Magnet for every Metal without Diſtinction, *et forte aliis omnibus communis*, as the above-nam'd Author has it; and perhaps the next Time I come into theſe Parts I ſhall be able to ſhew

a natural and artificial Concrete, or Compoſition, both which will attract Lead, as the Loadſtone does Iron.

Now in caſe there is ſuch a Thing, that will in the aforeſaid manner attract Lead, is it not reaſonable to ſuppoſe that it will have the ſame Effect upon Lead Ore, as it is manifeſt the Magnet has upon that of Iron? Let it be ever ſo deep in the Earth it will diſcover it; and this, Sir, I think in every Shape would anſwer the Ends of the *Virgula Divinatoriæ*; and therefore I am not aſham'd to pronounce there is ſuch a Thing, and let the ignorant of it, merely becauſe they are ſo, ever ſo long perſiſt in their Denials of its Exiſtince, they will never be able ſo far to gain their Ends as to have it buried in Oblivion.

I cannot omit obſerving, how all your Inquiries upon this Head have been made from ſuch Authors, that attribute the whole Buſineſs to be depending upon ſome Planetary Influence, and particular Divine Gifts of certain Perſons, which is as erroneous as the reſt of your Aſſertions. What whimſical Chimeras muſt not you ſeem to entertain to every one the leaſt vers'd in Natural Philoſophy, when they ſee you attribute to ſome heavenly Conſtellation the Government of ſuch Things as are placed in the Bowels of the terreſtrial Globe? Mixtures in their Nature, created at once by the *Fiat* of the Almighty;

mighty, as the heavy opake earthly Parts ere ſeparated from the fluid ones, not admitting of further Generation: But to theſe you have too much lean'd; this Sect you have too cloſely follow'd; and for want of being better acquainted with the Theory of this Part of Nature, you have not been able to extricate yourſelf out of theſe Errors: Pardon, me, Sir, for deeming that Sect of Profound Naturaliſts, whoſe Province you ſo much admire, guilty of Errors; but I think I have Reaſon on my Side. I have view'd them, with the Line and Plumbet of their Philoſophy, taking the Diſtances of the Planets, and calculating the juſt Proportion of their moving Powers in the different Degrees of their Approximation or Elongation; yet after all their curious Speculations, have not found two in a hundred of them agree or conclude the ſame. Is not then the Uncertainty of ſuch ſufficient to diſcourage the reſt of Mankind from entering to them? Had you ſeen, and taken the vice of the Author of the *Spectacle de la ature* Diſplay'd, to his Pupil alier, as he is pleas'd to call philoſophical Enquiries he ight to the Sun, and get Nature and Operations , and applied yourſelf nd leſs myſterious might have publiſhed

liſhed ſomething that would have been of more Service to your Fellow-Subjects.—I'll deliver it to you in the ſame Words I have found it in the *Engliſh* Tranſlation.

" Permit me, my dear Chevalier, to clip " the Wings of your Curioſity. I am in- " deed delighted to find in you ſuch a Thirſt " after Knowledge, but let us not ſoar too " high above the Earth, leſt we meet with " the Fate of *Icarus.*" Though the Story is fictitious, yet the Moral is inſtructive; " Beſides, I do not know whether it be " lawful to extend our Curioſity much far- " ther. We all behold the Beauty of the " Sun, Moon, and Stars, and enjoy all thoſe " Benefits that flow from their regular and " conſtant Revolutions. You will e'er long, " probably have an Opportunity of going " through a Courſe of Aſtronomy, and get " acquainted with the Motions of thoſe " heavenly Bodies, which divide the Life " of Man into that agreeable Variety of " Times and Seaſons, with which it it di- " verſified; but as to the particular Nature " and Structure of that glorious Luminary, " which is, as it were, the very Life and " Soul of Nature, it would be Preſumption " in me to undertake to give you a De- " ſcription of it, who am not thoroughly " acquainted with that of a Straw, that is " blown about by the Wind. The Con- " templation of the Heavens, and the hea-

" venly

" venly Bodies, makes one great Part of the " Happineſs of our Lives; but the Nature " of that innumerable Multitude of Lights, " which, on Account of their vaſt Diſtance " from us, appear but as ſo many Spangles " through our beſt Teleſcopes; their Ope- " rations and Influences, their Uſe and De- " ſign; theſe are Diſcoveries, which in all " Likelihood, we muſt never expect to at- " tain to in our preſent State."

I confeſs a great many of my Countrymen have run on in this nonſenſical Strain, and have obſerv'd ſome of your Brother-Followers of that Syſtem to have cracked their Brains before they arrived to a much greater Knowledge than yourſelf, by poring over thoſe ſeducing Authors. Now, I appeal to you, if they did not deſerve the Halter more than the Author of the *Virgula Divinatoria*?

You have likewiſe quoted *Glauber*, as one of your Opinion, to whom, I ſuppoſe, you have given no ſmall Credit, as I ſee you have dignified him with a very fine Character; but in that you have expoſed your Judgment, for to his Propoſition may be very well applied, *ſi Cœlum ruat*; or when the Sky falls we ſhall catch Larks; ſince neither he nor you will ever be able to ſmelt the ſo call'd ſeven Metals into one ſolid Maſs: But you thought you muſt have Recourſe to Myſteries to unravel Myſteries,

Myſteries, not knowing, that the greateſt Diſcoveries have been made by the plaineſt Studies, and a great many by Chance. But enough of the *Virgula Divinatoria*; let us go to ſome other Paſſage, and firſt to that of Ore.

You will perhaps think, that I ſhould have begun with that, before I had touch'd upon your Section of Veins, and find Fault becauſe I go not on in a regular Manner: But I hope you know, that thoſe Niceties need not be obſerv'd in Letters. Every one has the Liberty of ranging his Ideas as he pleaſes, and raiſing his Objections to Things, as they occur to his Mind; ſo I doubt not, Mr. *Hooſon*, but you will excuſe my not proceeding alphabetically. Indeed, a Dictionary-Writer lies under indiſpenſable Obligations of obſerving certain Rules, which you have either neglected, or are not acquainted with, otherwiſe you would have inſerted under a particular Paragraph called Smelting, what I have not yet found in your Treatiſe, the greateſt Part of what you have given us a Detail of in your Section of Ore. But ſuch trivial Things I can eaſily overlook; neither had I mention'd them, only that I thought your Remembrance of them would incline you the more readily to excuſe my Non-conformity to your Alphabet.

But

But to return. In regard to Ore, you tell us, that there are three Sorts, namely, firſt *Potter's Ore*, ſecondly *Steel Ore*, and thirdly *White Ore*. Theſe, I find, in your Opinion, are all the different Species of Lead Ore in Nature; but I am ſure you are vaſtly miſtaken: I myſelf have met with, and picked out of the Carts, more than three, and three to them, different Sorts of Lead Ore, as I ſaw them carried to the Mills to be ſmelted; and theſe are ſo common here in *Flintſhire*, that I daily ſee them, and every one of them equally deſerve to be diſtinguiſh'd by different Names, as thoſe you have mentioned: Nay, what is more, I myſelf know above twenty different Sorts, and doubt not but *Wales* produces them all; yet I believe there are a great many more, that have eſcap'd my Knowledge: Nature has laid up too great Plenty in her Storehouſe; ſhe has been too liberal in her Productions, for me to get acquainted with them all; yet to every one of them ſhould as well be allotted their Characteriſticks, as thoſe you have diſtinguiſhed by the different Names of *Steel*, *White*, and *Potter's Ore*, ſince there is as much eſſential Difference amongſt them all.

But your Diſtinctions of theſe are not adequate to reaſon; you ſay, the Steel Ore is more aged, and the Potter's Ore more youthful and florid. I have before obſerv'd, that

that it neither is, nor can be reaſonably ſuppoſed, that Metals grow, but were the ſame *ab Origine*; and this my Aſſertion is grounded upon ſound Reaſon as follows:

All Metals without Exception, are Mixtures, and ſuch Mixtures as cannot be united without the greateſt Fermentation and Efferveſcence enſuing imaginable, which cannot poſſibly be performed in the Bowels of the Earth without our Knowledge; therefore it is reaſonable to ſuppoſe, that all Metals were *ab Origine*.

Good God! What a Shock would the whole Fabrick of Nature receive, the Earth would be ſhaken from the Center to the Surface, whole Towns would be overthrown, and Kingdoms laid in Ruin, if at this Time a-day the metallick Mixture was perform'd in the Bowels of the Earth. Do not we daily hear what terrible Phænomena are produced? What fatal Conſequences enſue, when but a ſmall Quantity of Sulphur, Water, and Iron Ore meets? ſince the Ebullition, which naturally attends theſe three Bodies coming into Contact, occaſions what is commonly called Earthquakes. The ſame Thing happens upon the Mixture of a concenter'd Acid with Water; the ſame Efferveſcence ariſes, and that to ſuch a Degree, that it burſts out into a Flame, in caſe it meets with the leaſt combuſtible Matter: And I aſſure you, that the Fermentation

that

that is excited by the Mixture of Metals cauſes a conſiderable deal more direful Phænomena, than what the abovementioned Iron Ore, Acid, and Water do; therefore I think this may be ſufficient to prove, that Metals are not now engender'd in the Bowels of the Earth, but were from the Creation. But let us proceed.

I can't but think you have been very deficient, in not having acquainted us what *Potters Ore*, and the other two that you have mention'd, are in their Nature: An Analyſis of them ſhould have certainly been given by every Metallick Writer; but you have endeavoured to ſupply that Deficiency by a Rehearſal of what you have been told by one *J. W.* a well-skill'd Man in thoſe Things, as you phraſe him and them, let us therefore examine how far he can ſtand the Teſt of having done it for you.

Mr. *J. W.* tells us, that he has made many Trials of theſe Kinds of Ores, therefore knows by Experience, that the beſt of the *Potters Ore* holdeth very little Silver; that it is not worth while to refine it; that it is ſold for a good and advantageous Price, and carried into *Holland*, where, they ſay, they make uſe of it about their Earthen-Ware. In this, my good Friend, I muſt tell you, you are wrong inform'd: I am very well acquainted with the Nature of the Manufacture of the *Dutch* Earthen-Ware; Ore can-

not be uſed in it, becauſe the Sleck that all Ore produces, is of a black Colour, which would obſcure or ſpoil all the other Colours that are uſed in the ſaid Earthen-Ware: Therefore your Friend muſt have been miſ-inform'd. 'Tis not Ore, but Litharge, or the Scum of Lead, that ariſes in the Puri-fication of Silver, and of this very little is conſumed in their Earthen-Ware Manufac-tories, 150 Tons being enough to ſerve their Purpoſes. In ſhort, this I think is abun-dantly ſufficient to induce you to believe, that your Friend Mr. *J. W.* has given you a wrong Information as to this Point.

But in order to unriddle this Myſtery, it will be neceſſary to premiſe a few Things concerning *Holland* and its Natives. Firſt, you muſt know, that *Holland* is a Refuge to all Strangers; thither all Schemers have Li-berty to reſort: They know the Sweets of Trade, which makes them encourage every one that can in the leaſt aſſiſt them to pro-mote it: They are ſo very far from being jealous of Strangers, that they make not the leaſt Scruple of Naturalizing; nay, what is more, of qualifying any Stranger, if in him there appears the leaſt Merit, ſo far as to make him capable of enjoying a Burgo-maſter's Privileges for the Value of Thirty Shillings, let him come from what Part of the World he will. This draws all Artiſts thither; neither have they occaſion to be weary

weary of their Company. On the contrary, in this Part of the World you ridicule, mock, and laugh to Scorn every one that comes amongſt you: A Foreigner no ſooner appears upon your Coaſt, but, without entering into his Merit, you are making your ſatirical Remarks, and caſting your conjectural Reflections about him: You are ſo far jealous of him, that inſtead of expecting to reap any Advantages from him, you conclude that he is come to pick your Pockets. You don't conſider, that he cannot ſerve himſelf without ſerving you: You are too ſelf-opiniated to think you can learn: You look upon yourſelves to be the only politick People in *Europe*; the greateſt Proficients in Trade; every one that comes amongſt you, comes to pirate ſomething from you: But take Care, leſt whilſt you are endeavouring to keep the reſt of the World in Ignorance, you are not keeping yourſelves ſo. Viſit but the Manufactures of other Nations, but let it be done without Prejudice; for Improvement, not for Pleaſure, and you will ſee them flouriſh to the full as much as yours; at leaſt, in every Country you will ſee ſome new Improvements, ſome new and uſeful Diſcoveries; you will ſee how much this Nation ſuffers for Want of giving due Encouragement to proper Artiſts; and how many and great the Advantages are, that *Holland* with other Nations

reap by them. Pardon this Tranſgreſſion, and I'll tell you now what Uſe and Purpoſe your *Potters Ore* in *Holland* is turn'd to.

Holland, though it is without Mines, yet being a flat Country, and well water'd, 'tis conveniently ſituated for Smelting-Mills; for the carrying on of which they have got a Number of able Smelters; and for thoſe it is that they fetch all the different Sorts of Ore from all the different Markets of the World, which theſe Artiſts ſmelt to the greateſt Advantage imaginable of the Proprietors: So that I can aſſure you, your *Potters Ore* here from *Halkin*, *Holywell*, and other adjacent Places, in *Holland* yields a conſiderable Quantity of good fine Silver as well as Lead, per Ton: Yet this is the Ore you think not worth while refining, tho' for that Purpoſe chiefly it is exported thither, yet at home you ſay it is not worth extracting; but the Reaſon is good, 'tis becauſe you can't; you know not the right Method of doing it; and I dare venture to ſay, no one in this Country does; tho' I doubt not but there are a great many, that will not ſcruple to pronounce me a *Braggadocio*, and call me a *Mountebank*, as they have already done, becauſe I aſſert a Truth which they are ignorant of: But let it ſeem to them ever ſo incredible, that the chief Reaſon why the *Dutch* export it is to extract the Silver out of it, nevertheleſs, I ſpeak it

not

not from Hearſay; I have not taken another Man's Word for it; I have Matter of Fact to ſupport my Aſſertion; I can do the ſame myſelf; but I ſhall not take upon me the Trouble to teach you how, or in what manner it is to be perform'd; I have better Views in my Head; I deſign to ſerve myſelf and my worthy Friends with it firſt, and after that the Publick may expect to be uſed in the ſame manner as I am uſed by them. But ſhould I at preſent have good Nature enough to make known this Diſcovery to you and all your Countrymen, and tell you by what Art it is to be done, I am ſure, both they and you would laugh at me for it, and call me a good-natur'd Fool for my Pains, though you yourſelves would be the People that would profit by it; therefore I deem myſelf already diſpenſed with in that Reſpect.

In ſhort, at preſent I ſhall make no further Remarks concerning your Method of Smelting, than what I have already made concerning your Way of Mining, *viz.* that it is but yet in its Infancy: And this I can ſafely aſſert; for as often as I go from hence to *Baggilt* and *Flint*, I am ſo often ſurpriz'd to ſee what vaſt Quantities of Metal is thrown away along with the Sleek out of the Smelting-Houſes. This, perhaps, at firſt, will ſeem incredible to thoſe that think you have ſo many knowing and skillful People in the Way of Smelting, that live

betwixt

betwixt here and *Flint*; but I aſſert nothing but Truth; and their Incredulity will leſſen upon their calling to their Remembrance the late jovial Time, when you mended your Roads with *Lapis Calaminaris*.

So much for Smelting. But why have you judg'd *Steel Ore* more aged than *Potters Ore?* I think, good Sir, I have already proved that Suppoſition to be erroneous: 'Tis not the Difference in the Age that occaſions the different Texture of its Parts; *Potters Ore* is every jot as old as *Steel Ore*, the Difference conſiſts in the different Particles that enter the Compoſition or Combination of one, and of the other, as I am about to ſhew.

Steel Ore conſiſts of a good deal of Silver, Antimony, Lead, *Terra Ferri*, a ſmall matter of *Terra Cuperi*, a good deal of Sulpher and terreſtrial Parts; theſe Principles occaſion the metallick Texture, and not Age, as you have falſely ſuppoſed.

Now, my good Friend, let us examine what the *White Ore* is: You have harangued nothing about that, but have left us to gueſs at the Analyſis of this metallick Concrete or Mixture; and indeed, ſo you have done at that of the reſt of your mention'd Ores, ſo I will tell you what the *White Ore* is, as neither you nor your Friend has been able to give us any Account of it. Its Matrix is *Terra Ferri*, or Iron Earth, and what occaſions

caſions its white Appearance is an Acid originally liquid, carried thither ſometimes in greater, ſometimes in leſſer Quantities, by the Waters or Rivulets, which flow in a conſtant Current through the Bowels of the Earth, where ſuch Ore is found, which inſinuating itſelf into its Pores and Inteſtines, and being ſpecifically heavier than its Vehicle Water, and having an aptneſs to Coheſion, fixes, fits, and faſtens the intercepted Particles in the Cavities of the Matrix, and when depriv'd of its Vehicle, puts on the Shape and Appearance, and in reality is nothing elſe but a native *Saccharum Saturni*, or Salt of Lead; and this is what you call *White Ore*, which, if your Smelters knew how to manage, is as fit for Smelting, as any other Lead Ore.

In the Section of Damp, you give us a full Account of the Damps frequently met with, and wiſh that ſome skillful Naturaliſt would preſcribe a Preſervative in this Caſe, out of Charity to the poor Miners; which your Requeſt I ſhall with Pleaſure comply with, though I don't pretend to any great Skill in Natural Philoſophy, knowing my own Incapacity, and that my Genius won't admit of it: However, I'll lay you down here ſome Receipts, which if rightly uſed, will be of no ſmall Service to the Miners, as I have often made uſe of them myſelf,

myſelf, and as often have had the Pleaſure to ſee the deſired Effects proceeding from them.

But in theſe Caſes it is fit, that every Individual acceſſory Cauſe ſhould be corrected as far as poſſible in its Origin; *tolle Cauſam, tollitur quoque et Morbus*, by taking away the Cauſe, you take away the Diſeaſe; and as various are the Cauſes, ſo various muſt be the Antidotes. Now as Firing is the chief Cauſe of one Sort of Damp, tho' according to your Aſſertion, it is not now-a-days much in Uſe in Mining; however, where it is, or happens, that they are obliged to make uſe of it, let their combuſtible Materials be well impregnated with a Solution of common Salt, and then well mixed with ſome reſinous Body, as Pitch, or ſuch like, and where the Mine will afford or allow of it, burn beſides one or two Ounces of Aſphaltos: And this Method, I am ſure, how ſimple ſoever it may appear, will be of very great and ſingular Service in theſe Sort of Damps.

Blaſting, or ſuch Damps as are cauſed by Gunpowder, are ſometimes detrimental to Miners, where, as you ſay, there is but little Wind, and the Vein of Ore lies looſe, or has ſome Cavities; for there, I am ſure, the Smoke of the Gunpowder, with the Heat of the Fire will diſſolve, and raiſe up in Fumes a great deal of the *Terra Mer-*

culialis

curialis Metallorum, will occaſion a poiſonous Damp; therefore it is neceſſary that the Gunpowder be mixed with ſomething that will prevent the Solution, and ſheathe and envelope the acid Particles of the Salt-petre and Brimſtone, which are the Occaſion of them, in order to prevent them.

Any unctious or oily Body will do it, and it will be ſo far from being detrimental to the Blaſting, that it will be rather of Service to it, becauſe it will add to the Strength of the Gunpowder, and ſo make it do more Execution than if it was us'd alone; and not only hinder its Smoke from occaſioning any noxious Damps, but deſtroy the natural poiſonous Qualities that lodge in the Cavities of the Mines.

The Mixture that I would have made uſe of with the Gunpowder is as follows:

Take one Pound of Gunpowder, one Ounce of Venetian Oil of Turpentine, two Drams of Camphire, and half a Dram of Borax.

Mix them well together in a Marble Mortar, and they will be fit for immediate Uſe; and the Wetneſs, occaſion'd by the Oil of Turpentine, will be in no Ways detrimental to the Gunpowder, as to its Execution.

In fine, when there is a Mine infected with Damps, let them be of what Nature ſoever, the Miners may guard themſelves againſt any evil Accidents, that might accrue from them, by taking, before they go down, a Tea-Spoonful and half of the following Antidote in a Spoonful of melted Freſh-Butter. *N. B. Butter in theſe Caſes is a far better Vehicle than expreſs'd or diſtill'd Oils.*

R. *Extract. Succin Uncias duas. Ol. Cardui Benedict. Rut. Chamæmel. aa Scrupl. un. fiat Mixtura.*

This, I am ſure, will be of more Service to Workmen in Mines, than to get drunk with Ale: However, ſo far I'll agree with you, that a Man that has ſwallow'd down a great Quantity of Ale, may venture to go down into a Lead Pit infected with the venomous Exhalations of the Damp, and come ſafe out again; becauſe the aromatick oily Quality that is in the Hops, and extracted from the common Method of Brewing, and the Spirit of the Ale itſelf braces and ſtrengthens the Nerves to ſuch a Degree, as to guard them ſufficiently from the pernicious Effects of theſe mercurial Fumes; and perhaps the mucilaginous Parts of the Malt, by enveloping the noxious Effluviæ, may in ſome Meaſure aſſiſt in preventing the fatal Con-

Conſequences that commonly attend them: For it is manifeſt, that the nervous Syſtem is the firſt upon which they exert their fatal Cataſtrophe, as may be ſeen by the immediate Abolition of all the Senſes, ſo that no Senſe of Pain enſues from their Operation.

Though the Miner has taken the above-preſcribed Remedy, he muſt not immediately go under-ground, but muſt at leaſt ſtay an Hour before he ventures down into ſuch Pits as are infected with the Damp, during which Time, if he walks about, it will be of Service in promoting the more ſpeedy Entrance of it into the ſanguiferous Veſſels, from whence it is to be carried and communicated to the Nerves, by whoſe Means they will be braced up, guarded and defended againſt thoſe volatile mineral Particles.

However, it is not adviſeable, neither can it be expected, that thoſe Miners that work amidſt ſuch noxious Effluviæ, tho' they have taken the before-mention'd Antidote, can ſtay long under-ground, unleſs the grand Obſtacle, the Damp itſelf, is remov'd, which they may do effectually during their Stay, as they may remain half an Hour without running the leaſt Riſque of receiving any Damage.

To remove theſe Damps, there has been ſeveral Ways and Means try'd; but the moſt ſucceſsful hitherto found out, is the bringing in of Air, and therefore is moſt commonly

practiſed; but then 'tis very often attended with a great deal of Trouble and Expence. I, for my Part, chuſe nothing elſe, where it is difficult to bring in Air, than the *Spiritus Urinoſus volatilis*, or the volatile Spirit of Urine, two Quarts of which being poured into ſuch a damp'd Pit, will occaſion ſo great a Rarefaction, that will not only overpower the poiſonous Vapours, but will, and that for a long Time, ſupply the Defect of Air.

N. B. *When they pour in the Spirits, they muſt throw them as far as poſſible from them, for Reaſons obvious to every one, and then muſt get up again as ſoon as poſſible, and not venture down again under the Space of twelve Hours.*

This is a certain and never-failing Remedy. But perhaps you will ſay, that it is too dear in this Part of the World; poor Miners cannot afford to conſume it in the above-named manner. To this I can make no other Anſwer, than that the Miners that are in Need of it, and at the ſame Time require it ſo cheap, muſt make it themſelves, and then they will be able to make Uſe of it as plentifully as they will have Occaſion for.

So much for this at preſent. Perhaps ſome time or other, when I have more leiſure Hours upon my Hands, I ſhall give you more upon this Subject; but now let us proceed to look a little further into your Book,

and

and carefully weigh that great and uſeful Diſcovery, you have made, *viz.* how a Gentleman may know whether he has Mines in his Land or not.

I will here have nothing to do with what lies ſcatter'd up and down in your Treatiſe, I will only begin with the firſt Propoſition of your *Appendix*; but that out of no other Reaſon or Motive, than that ſhould I do otherwiſe, I ſhould exceed the Bounds and Limits to which I have propoſed this Letter ſhould only extend: Add to this, that as far I have ſeen, the Ways and Means you have laid down, are ſumm'd up there. But I could not forbear laughing when I came to the full Stop you petition'd for: What, did you ſo ſoon begin to be aware of the Difficulty of the Task you had undertaken? Did you ſo ſoon begin to find out your own Incapacity? But you ſoon overcame theſe Difficulties, tho' with what Applauſe I won't determine. I can't ſay how far your fine Apology you have made to your Readers will cover and ſupply your Defects, in putting them in mind of the great Difficulties you and your Brother Miners labour under; and that you don't at all pretend to ſee into the Bowels and Concaves of the Earth, any more than a Phyſician can ſee into the Body of Man.—Pray, Mr. *Hooſon*, whence came you acquainted with the Power and Abilities of a Phyſician? By what Means

do

Do you know that a Phyſician can't ſee into the Body of a Man? Pray don't conclude, that Phyſick is built upon ſuch a Set of precarious Principles as your Theory of Mining is: The skilful Phyſician begins his Reaſoning with ſome one Propoſition, which is a Data, conſiſting of ſelf-evident Principles, on which all the reſt depend: The Second has a very near Relation with the Firſt; the Third with the Second; the Fourth with the Third; and ſo on through the whole Chain; each Propoſition expreſſing a Relation to the former, and at the ſame time is connected with the latter, through every the leaſt Remove, 'till he comes to the Diſorder itſelf: Then Anatomy inſtructs him what Part is affected, and after what Manner; and in order to gain a Cure, he has Recourſe to Chemiſtry, a Science grounded upon a Set of never-failing Experiments: Therefore a Phyſician, metaphorically ſpeaking, ſees into the Body of a Man. Indeed, you have ſaid, that *there are proper and apparent Signs and Symptoms at the Day, that indicate to you Miners the Nature of Places, whether they may contain metalline Veins or not.*

But, Sir, in your ſymptomatical Proceſs there is a great Deficiency, which Deficiency you have endeavoured to ſupply by a Compariſon of the like Deficiency in the phyſical Symptoms: But give me leave to tell you, that

that if you knew a Quarter of the metallick Symptoms under-ground as ſure and as certain as an able Phyſician (Underlings excepted) knows by the Symptoms the Difference of Diſorders, then I would offer you my Hand, and declare you to be an expert Miner, becauſe you would really then deſerve the Title; but you are ſadly out, when you call for the Authority of the antient and wiſeſt Miners, as I am afraid you know nothing of their Practice.

Then you proceed to tell us, that *low and flat Countries ſeldom afford any Lead-Mines, but a Country lying ſomewhat high and mountainous, and thoſe Mountains made up of Rocks*, &c. *are the moſt natural Places for the producing Mines. Riſum teneatis Amici.* As for my Part, my dear Mr. *Hooſon*, I cannot forbear telling you, that your Way of Reaſoning here is ſo very weak, that I am ſorry to ſee ſo much Paper waſted in it. What does this amount to more, than if ſome young Heir to a great Eſtate ſhould ask me, what kind of Women were the moſt likely to bring him Offspring, I ſhould anſwer him, that it was almoſt morally impoſſible that an old Woman of Sixty Years of Age ſhould Conceive; but that it was very likely and natural that a young healthful Lady of Twenty would bring forth Children. What would he think himſelf the better for my Advice?

Advice? Would not he laugh at me, and tell me, that he knew that before? And indeed, I can ſay the ſame of your boaſted Mining Inſtruction, the above Compariſon may be very juſtly applied to your Aſſertion; therefore give me leave to adviſe you for the future, never to ſpend your Time in laying down ſuch inſignificant Rules as are known to all the World. Indeed you have added, that *the more regular they are, the more likely*; but this again we all know. Had you proceeded tho' to have informed us where or in what Place the Ore lies under ſuch Rocks, I would then have ſaid you had deſerved the Miner's Cap; but there lies the Difficulty, *hic Labor, hoc Opus eſt*. Yet this you ſhould have done, to have perform'd your Promiſe. When you are about laying down certain poſitive Rules, you ſhould avoid all general and only probable Symptoms, and ſtick cloſe to the immediate ones, otherwiſe you are doing nothing. Then you tell us, that *theſe being conſider'd, we muſt next obſerve what Rocks, and of what Kind they are that appear to the Day, their Colour, after what manner they lie, whether dipping, riſing, or level.* Pray, what is all this to the Purpoſe? You have given us three hard, cramp, puzzling Terms, but have not told us what we muſt infer from them. But hold; perhaps you will ſay, it is becauſe I don't underſtand *Engliſh* better; that

that I don't comprehend them; and, indeed, that may be true: But you have not told me, how I can conclude where there is Lead Ore after I have ſeen and obſerv'd the Dipping, Riſing, or Level of the Rocks, ſo I ſhall not think it worth my while to dive further into them, but ſhall, and all Naturalifts with me will deem you worthy of publick Cenſure, for having promiſed more than you are able to perform. Neither ſhall I trouble myſelf in citing and anſwering the reſt of that Paſſage, ſince every one that looks over it, will find it as full of Myſteries, and as little to the Purpoſe, as what I have already done.

In the ſecond Paragraph you give us your Reaſons why one ſhould make a Diſcovery of the Rocks, *viz.* becauſe Veins are moſt naturally bred there; which is as abſurd and ridiculous as the reſt, as may be gather'd from what I have already deliver'd concerning the Generation of Metals. Indeed, had you ſaid, that Stones and Rocks contain'd, or were intermix'd with the *Terra Vitrificabilis Metallorum*, and that it ſeemed that Providence had appointed them to Metals to cloath them; or that it was natural to ſuppoſe, that the Rocks leaded to ſome more clean and precious Concrete, as there was ſomething of Affinity or Reſemblance to be diſcover'd betwixt them, and other Minerals, as might be ſeen that they contain'd

ſomething of the ſame Principles, then you had argued ſome little like a Naturaliſt; but as it ſtands now I think you have only ſaid a great many Words in which there is nothing contain'd.

Then you tell us, that the Signs of Veins are ſometimes appearing in Rivulets, or Water-Courſes, and you ſhew us in what Manner to go about to diſcover them; but let me caution no one to be ſo fool-hardy as to venture upon ſo precarious a Foundation: Not one in a thouſand will diſcover a Mine by finding ſome ſmall Pieces of Ore intermix'd with the Sand in his Water-Courſes or Rivulets; and for the Truth of this my Aſſertion, *Scotland* is a ſufficient Witneſs, where, for theſe many Years they have waſhed Gold and other Metals out of their various Rivers, yet to this Day have not been able to find the Veins; which may be ſufficient for an Anſwer to your Scrawl in this Reſpect: But before I have done with it, muſt beg of you to conſider, that the Sands in the Rivulets which come off the Mountains are almoſt in a continual Motion, therefore by this Means the ſmall Particles of Ore are convey'd to ſuch a Diſtance, as will render it impoſſible to find out from whence they came, unleſs you have ſome more natural Aſſiſtance, than what you have given us, in adviſing us to *make Pools higher up for Diſcovery, 'till you can find none*

none at all of the aforeſaid Grains; for how do you know how far the aforeſaid Grains have come along with the Current of Water under-ground.

In the third Paragraph you purſue your Conjectures, which, as ſuch, do not deſerve to be anſwer'd: But you certainly here forgot yourſelf; you did not remember your Title-Promiſes, when, inſtead of paſſing Sentence and pronouncing the Exiſtence of a Mineral in ſuch a Place, you deſire your Readers, for further Certainty, to have Recourſe to Trial and Experience; ſince all the World thought and acted ſo before you and I was born.

In the fourth Paragraph (as I perceiv'd you began to draw towards a Concluſion) I expected to have found ſome wonderful Diſcovery: I thought at length you would have lain down ſome general Rules, ſome certain Axioms, whereby you would have fulfilled your Promiſe, to *inſtruct a Gentleman how to know whether he has Mines in his Land or not*; but, alas! where I expected moſt, there I met with the greateſt Baulk; I ſoon perceiv'd you there dwelt upon Trifles. What have you done for us by telling us that *Veins are ſometimes accidentally diſcover'd, as by the Tread of a Horſe-Foot in ſlipping on the Ore, has laid it bare*; *by Ditching, and in Highways, after the Fall of much Rain*; *in Places that*

are gravelly, and will tread up and be waſh'd away by the Stream running down, many times is left or waſh'd bare, &c. Has not every one in a Mining Country heard of the like Accidents? But muſt every one wait for theſe fortuitous Events? No! Fortune does not equally ſmile upon every one; and ſuppoſe the Ditcher for his Maſter throws up a Lump of Ore, or ſome String ſhould be expos'd to Sight by any Accident, are theſe ſufficient Grounds to excite the Proprietor to venture? I think not; and I will venture to ſay, there are but few out of Numbers of thoſe that have, been ſucceſsful.

Indeed, I won't deny, but that ſome Things in this Paragraph would have given us ſome Inſight, had you handled them right; ſome Symptoms, ſome Signs of Minerals may be gather'd from *Mole-hills*, *Graſs*, *Corn*, *Dew*, &c. that will indicate ſubterraneous Metals; but you have not pointed them out to us; you have not told us what Colour they are tinctur'd with; what Particles they are impregnated with; and this Defect of yours muſt either proceed from Neglect or Ignorance, therefore not to be pardoned; for if from the former, where have you fulfilled your Promiſe? And if from the latter, why did you make it? Why did you undertake a Work you was not able to go through with? Muſt the Landlord ſtill wait 'till ſome happy Flood waſhes down ſome Pee

of

of Ore? 'till ſome lucky Horſe bares a String by ſome fortuitous Tread? and then where muſt he find the Body? Muſt the Mole be his divining Pioneer? If ſo, I wonder, that inſtead of deſtroying thoſe uſeful Animals, you have not advis'd him to let the Swine come to their Aſſiſtance, to help them to throw up and ranſack his Land, if by ſuch remote Cauſes only Mines are to be diſcover'd, they perhaps will be of Service.

Theſe your Rules now will certainly appear to you very inſignificant, however ſo good an Opinion you might once have entertain'd of them. I find you thought they promiſed great Things, otherwiſe, I think, in the fifth Paragraph you would not have own'd, that *you knew not what further could be added for Inſtruction about Mines*; *you would not have pronounced them to be general ones, ſufficient to make a Miner*, &c. But concerning the Falſity of this your Suppoſition, I have remark'd enough already.

You tell us, that *ſome Gentlemen have thought* (*ſuch as have been Adventurers at Mines*) *that it might be of Uſe to the Miner, to obſerve the ſpecifick Gravity of Ores, Soils, Sparrs*. &c. 'Tis true, this is one Branch of Mining, but it's far from being the firſt; 'tis not the Touchſtone; 'tis not the Stern the Miner muſt ſteer his Courſe by; it is Attraction, and on its Principles, the Theory of Mining depends. Indeed, they have ſome

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Connection with each other, becauſe they are the different Mediums, through which it operates, and the Loadſtone, when its *Vis attrahens* is of Service, acts through a Medium: As the Sea is the Medium to the Sailor betwixt him and his Port, ſo is the Soil, &c. the Medium betwixt the Miner and the Ore, and theſe too are neceſſary Mediums; for the Advantages we reap by them are ſo far from being contemptible, that they are to be accounted ſome of the greateſt Bleſſings we enjoy. The Sea is ſo far from being really any Obſtacle to the mutual Commerce and Intercourſe of different Nations, that it is on the contrary the very Cement of them; add to this, the Variety of Plenty it contains. In the ſame manner Divine Providence has not placed the different Soils as Obſtacles to hinder us from coming at the Riches underneath; no, their Situation is convenient; the vaſt Quantity of them would have almoſt cover'd the Earth; whereas now our Land is happily diſincumber'd from all that troubleſome Luggage, and the Surface of the Earth diſengaged from thoſe Embarraſsments, which would otherwiſe obſtruct all Huſbandry, and the free Paſſage of its Inhabitants, Metals, Stones, and a hundred other Materials, which are conſtantly employ'd for our Uſe, and were deſign'd to be a never-failing Treaſure for the Service of all

ſucceeding

ſucceeding Ages, are carefully locked up in vaſt Storehouſes under our Feet, where we are ſure to find them in all Caſes of Neceſſity: For Providence has ſo wiſely ordered it, that they are not buried near the Centre of the Earth, nor yet at ſuch a Depth as to make them inacceſſible by us, but at ſuch a proper Diſtance below the Surface, as that the Coat of Earth above them ſhould have ſufficient Depth of Soil to produce Fruits for the Uſe of Man, and yet not to be of ſuch a Thickneſs as to prevent his digging down into thoſe ſubterraneous Magazines of Treaſure, which are there depoſited to ſupply his Wants and Occaſions. By this Piece of natural Oeconomy we enjoy a double Advantage, and the ſame Spot of Ground yields us a two-fold Crop: * The one is hidden from us its true, and ſo are the *Eaſt-Indies*, and other foreign Ports, but the Compaſs directs the Sailor's Courſe to them; and there is a Compaſs or Magnet that the All-wiſe Director of Nature has allotted to be your Guide, would you not, inſtead of ſearching for it, ſhut your own Eyes, and endeavour to caſt a Veil over other People's.

I have obſerv'd above, that the Study of the ſpecifick Gravity of Ore, Soil, Sparr, &c. is not to be the firſt the Miner muſt en-

* *Vide Spectacle de la Nature* on Foſſils.

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ter upon; to get an Inſight, or attain to a Knowledge of that, he muſt have Recourſe to no leſs than the moſt valuable and conſiderable Branch of all Natural Philoſophy, Chymiſtry.; an Analyſis muſt be made of them; they muſt be reſolv'd into their firſt Elements, or component Parts, and their innermoſt Texture cloſely examin'd. It was by this Means that the Nature, Structure, Uſe, and Virtue of the Loadſtone was found out. Neither can we otherwiſe form a juſt Idea of any thing; it is impoſſible to attain to a Knowledge of the Nature of Bodies by looking at them only. What Pity is it then that they are not in theſe Parts as diligent and ſedulous in making a ſtrict Scrutiny into them, as they are in my native Country; they would find the Pleaſure, and reap the Profit of it, if they were.

But I perceive you begin to recant; you tell us, *you are very far from thinking, that Mining is at its Perfection, and frankly own*, that *you do not know of any thing material or uſeful, that has been found out for the better or more eaſy Diſcovery of Lead Ore, than what has been left to us by our Fore-fathers, but rather much impair'd by Neglect and Idleneſs.* This I believe. I ſhall take your Aſſertion for granted. I am ſenſible your *North-Wales* Miners do more Damage by their Sloth and Ignorance, than they will be ever able to repair: But I wiſh

you

had conſider'd that before you had began to ſet Pen to Paper; I wiſh you had firſt thought of ſome uſeful Diſcovery, before you had thought of appearing in Print: But if for the Inſtruction and Good of the Publick you was not capable of producing any thing, at leaſt you ſhould have ſet off, and put in its beſt Colours, the Art you treated; then you would have done ſome Good; you would have excited your Readers Curioſity; you would have ſtirred up in them a Deſire; you would have raiſed in them a Thirſt after the hidden Myſteries: So, by this Means, you might have advanc'd ſomething to the Emolument of the Publick. For it is often by ſuch Means, that Sciences come to be improv'd: And then, in ſome Meaſure, you would have gain'd the End that all publick Writers ought to aim at. I won't ſay, but you intended it, but you have not in any Shape executed it; on the contrary, by denying Matters of Fact, and turning to ridicule the very Pillars and Ground-work of Mining, your Writing has rather tended to create a Diſguſt, than an Appetite for it.

Your ſixth Paragraph is to me a Paradox, and without doubt nothing leſs to all the ſenſible Part of the World. *You take for granted, that ſuch Miners, to whom you now write, are by their own Experience ſomething acquainted with the Nature of the Work*, &c. This ſounds like a Contradiction to your Title

Page: I thought you had undertaken to teach a Gentleman how to know whether he has Mines in his Land or not, therefore was not ſuppoſed to write to the Experienc'd Miner; and I think you had better not addreſs'd your Diſcourſe to them: They will not vouch for your Performance; they will declare to you, that you have mentioned nothing but what they knew before; and the Unexperienc'd will tell you, that you have not perform'd your Promiſe to them.

You ſay very true, that *the Miners can judge better when they are at the Vein by the Ore itſelf, than from any Signs from the Soils*, &c. Does not every Body know that? But is this fulfilling your Promiſe? I thought you had engaged to inſtruct a Gentleman how to know, without working into the Vein, whether he has Lead Ore in his Land or not: And this is what the Publick expected from you; this is what every private Perſon is intitled to demand of you; therefore I do it now in this publick Manner.

Then you go to your Queries, which are Six in Number. Thoſe you offer to the Conſideration of the Practical Miner: But I find you know not what belongs to a Practical Miner, ſince you call him one, whoſe Buſineſs it is to work daily underground; but ſuch, I would have you to know,

know, in my native Country are called Labourers only in Mines; the Practical Miner there is educated in a regular methodical Manner, and act as Directors over the Labourers. In ſhort, Smelting and Mining there are taught like Phyſick and Divinity in your Univerſities here in *England:* And theſe Mining Schools, as I may call them, are ſituated in that Part of the Country where there are Mines; there the Pupils are oblig'd to go under-ground to work, and make themſelves acquainted with the Practical Part; and theſe are called Practical Miners, and amongſt this Claſs I rank myſelf.

I agree with you, if your Six Queries were reſolv'd, and the Nature of every Individual you have mentioned fully diſplay'd, the Art of Mining in this Part of the World would be improved; but you have not ranged them, and diſpoſed them in their proper Order, and a great many more, that are more material, and ought to be handled by ſome able Pen or other, you have omitted. I fancy I myſelf am capable of ſolving yours, but for many Reaſons at preſent cannot undertake ſuch a Work. Firſt, becauſe my Time and Leiſure won't permit me. Secondly, it would not be proper to place them here, becauſe they would ſwell this Letter into a larger Volume than yours. Thirdly, for Reaſons already mention'd, I think proper firſt to wait to ſee

how I am treated by your Countrymen. In fine, ſome time or other, if God continues me my Health, I will take them in Hand.

Then you proceed to the Concluſion of the firſt Propoſition, *the Difficulties of which, you think, you have fully clear'd: You think alſo, that a Man, by what you have written, may become a Miner, that has not known much of it before*, &c. However, I will not dwell any longer upon this Topick; I have already proved the Falſhood of this your Suppoſition, and will content myſelf, as you have wholly excluded the *Virgula Divinatoria*, with wholly excluding you from amongſt the Mining Preceptors. I will not further animadvert upon your Book, tho' I could have raiſed many more Objections againſt it, than what I have already done: I have only picked out thoſe Paragraphs that ſeemed moſtly to carry with them the Air of Truth and ſound Doctrine; therefore after I have told you by what Means the Art of Mining in my native Country is arrived to that Degree of Perfection it really is, I will make an End, leſt, ſhould I extend my Obſervations further, I ſhould be thought to encroach upon my Readers Patience. But firſt I muſt deſire you to recal your Words, and before you ſet Pen to Paper a ſecond Time, muſt beg of you to improve yourſelf.

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In *Germany*, as an Aſſiſtant to the Art of Mining, we call in ſeveral Branches of Chymiſtry (it is too large a Field, it is too great a Scope of Study for a Miner to run over the whole) and unleſs he is very well verſed in theſe, we think he is far from being capable of making any great Proficiency therein; and for this we have Reaſon on our Sides. As for my Part, I ſcarce know any Science, Art, or Trade, but what has ſome Dependency upon it: I frequently meet with Mechanicks, the Principles of whoſe Buſineſs are deduced from it, who are ſo ignorant, that its very Name ſounds to them like a Paradox; nevertheleſs I will not deny, but theſe may be tollerable good Artiſts in the common Way: But give them ſomething out of the common Road, offer or propoſe to them ſomething they have not ſeen practis'd before, you will ſee how they will rack their Brains about it; you will ſee, that the leaſt Obſtacle will be to them a Mountain; you will ſee them miſcarry in their Attempts, for want of knowing the Rationale of their Profeſſion. Even in thoſe they daily ſucceed in, they know not the Reaſon why nor wherefore they act ſo and ſo; they can't explain the Phænomena that happen in their common ordinary Proceſſes. Ask them to account for the conſtant Succeſſion of ſuch and ſuch an Effect, proceeding from ſuch and ſuch a Cauſe, they will immediately give you

you the old Woman's Reaſon, *It is ſo, becauſe it is ſo.* Or if they attempt it in a phyſical Way, it will be by ſome chimerical Hypotheſis of their own, much more obſcure than the Thing itſelf. If you want this to be further prov'd, ask but the Goldſmith what he knows of the Nature and phyſical Properties of *Salt Armoniack*, *Aqua Regia*, and many other Things they daily uſe, and you will ſee my Aſſertion verified. What Reaſon can the Brazier aſſign, why *Lapis Calaminaris* dyes Copper Yellow? What phyſical Idea? what natural Reaſon can the Gold-worker form of the extraordinary Effect of Tin and *Lapis Calaminaris* upon Gold? A great many Queſtions of the like Nature might the Miner be ask'd; for I aſſure him, that his Buſineſs is no leſs depending upon Chymiſtry than the abovemention'd.

Theſe Things of late Years having been juſtly regarded, and duly weighed by ſome of the moſt renowned Princes in *Germany*, they have appointed proper Perſons in their Schools and Univerſities to give publick Inſtructions, and read regular Lectures in the Vulgar Tongue on this Subject, from its firſt Principles, even to its moſt minute and nice Operations. And this is what I recommend to your Countrymen.

Such Students as are deſign'd for the Mining Buſineſs, employ themſelves in thoſe Schools

Schools chiefly in that Branch of Chymistry, called Metallurgy, and by this they obtain a great Insight into it, as by it they are taught to analize all mineral Bodies, such as Ore, Soil, Sparr, &c. and the Professors have large Collections of all Sorts of Fossils they can get, which they daily inspect, handle, and perform their Processes upon, so that when they come to the Mines, they are thoroughly acquainted with most of the mineral Concretes they there meet with; and if by Chance they should light upon something they are unacquainted with, as they are well versed in the docimastical Art, they can analize it, and by that Means soon obtain a thorough clear Knowledge of its Nature, and so are able to form a right Judgment of it.

When they have finished their *Cursus Metallorum*, they visit the Mining Countries, particularly *Fryberg* in *Saxony*, *Joachimsthal* in *Bohemia*, and the *Hartz*, which last Place belongs to his *Britannick* Majesty, as Elector of *Hanover*, and is enriched with some of the greatest Silver Mines, besides many other useful Metals and Semi-metals with which it is endow'd. These Students in Mining, when they arrive at the above-mention'd Places, agree with the Directors or Head-Miners to teach them the Art of Mining and Smelting, and put it in their Bargain to have the Liberty to make

use

of their Laboratory for Eſſaying and Analizing ſuch mineral Subſtances as they ſhall meet with, and think worthy of Examination.

After they have gone through the Theoretical Part, and ſeen as much as they can at home of the Practical, they travel, and viſit foreign Mines and Smelting-Houſes, which is another very neceſſary Requiſite to make a compleat Miner; but it is not poſſible for me to deſcribe the many and great Advantages that accrue from viſiting and examining the diverſe Sorts of Mines; but 'tis for this Purpoſe that thoſe Mineraliſts ſteer their Courſe chiefly into *Sweden*, *Hungary*, *Bohemia*, and to ſuch Mines in their native Country they have not been at before. Theſe Countries, and in particular *Sweden*, abound with Mines, and this wiſe Nation outdoes at preſent all the World in the Art of Mining and Smelting; ſo that making a Tour into this Country, they advance themſelves in Learning as well as Reputation. But you will ſay, that Strangers neither in *Germany*, *Sweden*, or *Ruſſia*, will be admitted into the Mining and Smelting-Works. I grant you, that they won't without a powerful Recommendation; they muſt obtain one from ſome of their Princes, by which Means they will always be very kindly received, and allowed free Liberty of ſeeing every thing that is there tranſacted. I myſelf cannot ſufficiently expreſs in what

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a polite and obliging Manner I was receiv'd both in *Sweden* and *Hungary*.

In *Sweden* moſt of the Nobility apply themſelves to the Art of Mining and Smelting; for when I was at *Fryberg* in *Saxony*, to learn this excellent Art, there were there then three young *Swediſh* Counts of the Firſt Rank, with whom I had the Honour to be a Fellow-Student. And at preſent the Nobility in my native Country begin to follow their Example: But we never wanted mineral Students in *Germany*, notwithſtanding the Nobility 'till lately troubled themſelves not much about it; but the *Swediſh* lie under a much greater Neceſſity for ſo doing, as there is not many beſides themſelves that dedicate themſelves to the Study of this Art; but the Labouring-People both in Mining and Smelting are in that Country very expert and skilful.

I am ſurpriz'd that here in this Part of the World the above-deſcrib'd Method in one Shape or other is not made uſe of for the Improvement of this profitable Art. I find it was not without Reaſon that the Tranſlator of the *Elements of the Art of Aſſaying Metals*, &c. &c. wrote by *John Andrew Cramer*, M. D. complain'd ſo much *p.* 454 in his Liſt of Authors, annex'd to the ſame Book, ' that the *Engliſh* Gentlemen were ' too indolent and negligent on this Head; '

ſince, this his Affirmative, I have found to be no ways foreign to Truth: Therefore I ſincerely adviſe you to erect a Mineral-School here in this your County, enrich'd with Mines, where the Pupils may have Opportunites to go under-ground, and Smelting-Houſes, to ſee the Practical Part: I don't ſpeak of ſuch Smelting-Houſes as you have at preſent in this Neighbourhood; they muſt be reform'd and amended, and manag'd after a quite different Method; and if they are once made as they ſhould be, great Advantages will be reap'd from them. Every Year two or three of theſe Mining Proficients muſt be ſent Abroad, and I dare ſay the Government won't refuſe to provide them with Recommendations to Foreign Courts, for Liberty of ſeeing the Art of Mining and Smelting, in the ſame Perfection as they both are there practiſed: And by this, and no other Means, muſt that of yours come to be improv'd, which if you neglect, in one Generation more your Smelting-Houſes will go to Rack and Ruin, as your diſcover'd Mines will be worked-out, as you are pleaſed to deem them. Neither do I think this any contemptible Employment for younger Brothers of ſome Gentlemens Families: For after you have three or four expert Men to inſtruct them in Mineralogy as well as Metallography, there would be

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in this Part of the World immenſe Treaſures diſcover'd. So the Proprietors of the Works would be able to afford greater Wages to the Managers and Directors of them, than they are at preſent, and ſo would by this Means be very handſomely provided for.

Which is all that at this Time I have to ſay or impart to you,

Who am

Your ſincere Friend,

D. W. Linden.

POSTSCRIPT.

I Remember I have not mention'd, how long the Lead-Pits infected with Damps, and cured by the Volatile Spirit of Urine, remain ſo, that the Miner may ſafely go down them, nor how long a Time is requir'd before ſuch Pits are cured.

The laſt Queſtion may be anſwer'd in a few Words; as it can readily be perceiv'd by putting down a lighted Candle, whether the Damp is diſperſed, ſince, if it is, it will burn there: And, indeed, the ſame Experiment may be made when the Effluviæ of the Damps are ſuſpected to be there gather'd again, as it will in the ſame manner denote them. But as Lead-Pits oftentimes emit Exhalations of ſuch a pernicious Quality, and which conſiſt of a more rank and deadly Poiſon, than thoſe from any other Metal, which to demonſtrate, I will ſpeak a few Words

Words hereafter; it is fit that ſomething more exact and material ſhould be deliver'd on this Head.

The Miner that goes into ſuch a Mine, is, as was before directed, guarded with a Preſervative, by which Means he may ſafely remain thirty Minutes under-ground, during which Time he muſt do what was before ordered: But beſides thoſe already laid down, he muſt obſerve the following Cautions, *viz.* He muſt be ſure to pour the Volatile Spirit of Urine as near as he can to the Place moſt affected, and that he does not throw it upon ſuch Places as are very wet, or very dry. But it ſometimes happens, that the noxious Effluviæ are in ſuch great Quantities, that they cannot be overcome at once, in which Caſes it is neceſſary the ſame Thing ſhould be repeated, 'till they are quite carried off. In Lead-Pits, tho' they are moſt commonly deſtroyed the firſt Time, but in Coal-Pits never, therefore in theſe laſt it muſt always be repeated.

When a Lead-Mine is once freed from theſe Damps, they return not ſoon, and very often never: But the ſame cannot be ſaid of Coal-Pits, where they frequently do. However, after they have been once diſſipated by the above-mention'd Method, the Place can never ſooner be infected again than

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in a Month's Time, unleſs there ſhould be in the mean while ſome Cavity open'd, where there was before a great Quantity of thoſe noxious Particles lodged. However, tho' it ſeldom happens that they return ſo ſoon as at the Expiration of a Month, yet for Security-ſake it will be proper (as the Experiment is ſo eaſily made) at every Full-Moon to try whether they are or no, by putting down a lighted Candle, or a Pan of Fire, and if they are again perceiv'd, the above-mention'd Method muſt be repeated, *viz.* more Volatile Spirit of Urine muſt be conveyed to the Place affected.

If any one ſhould be ſo inadvertent as to go down into ſuch Pits without having taken the above Antidote, or ſomething of the like Nature, and be thereby infected, in caſe he can be taken out alive, the known Method of Cure muſt be purſued, *viz.* He muſt be laid upon his Face on the Ground, and as ſoon as poſſible a large Quantity of a ſtrong Decoction made of Two Parts of *Pellitory of the Wall*; Two Parts of *Mint*; Half a Part of *Carduus Benedictus*, or *Holy Thiſtle*; and Half a Part of *Juniper-Berries*, muſt be thrown down him, and frequent large Draughts of it repeated every Day for ſeveral Days ſucceſſively, which will effectually carry off all noxious Particles of the Poiſon, which, according to the generally receiv'd

Opinion,

Opinion, are of a ſpicular Form *, and lodge themſelves in and vellicate the nervous Syſtem.

I have obſerv'd in my great Practice amongſt the Miners and Smelters two Diſtempers, which they call the *Smoke* and the *Bellon*: The firſt, which as it is occaſioned in the Lead-Smelting-Houſes by the Smoke, takes, I ſuppoſe, its Name from thence. The other, which is got in the Lead-Pits, is occaſioned by the Duſt rais'd in the working up of the Ore. In the Opinion of the vulgar theſe are two different Diſtempers, but that which they call *Smoke* is nothing elſe than a ſlighter Species of the *Bellon*; they only differ *ſecundum majus et minus.* It firſt ſeizes them in the

* Spicular Form is a Term of our Art very much us'd by *Monſieur Lemery*, and ſometimes talk'd of by our famous *Sydenham.* The Meaning of it is, the active or working Parts in all Poiſon, ſuch as occaſion an immediate or lingering Death, unleſs the Strength of Nature be ſufficient to overcome or expel it, as it ſometimes happens: But the *French* Chymiſt *Lemery* makes uſe of it in a much greater Latitude; he ſays, every Thing is endow'd with theſe *Spicula*, that affect the Senſe of Taſte with the leaſt acute or pungent Perception; and concludes them to exiſt in Bodies in a greater or leſſer Quantity, according to the greater or leſſer Degree of Pungency they are capable of affecting the Senſes with; and therefore ſancies he has obſerv'd in all Acids, Salts, Spirits, *&c. &c.* ſomething that bore the Appearance of a Spicular Form. But this is erroneous, as I could demonſtrate, if my Time at preſent would permit me.

Breaſt,

Breaſt, makes them aſthmatick, and when the Breaſt is cloſely examined, you find in a great Meaſure all the outward Symptoms and Appearances of an anaſarcous Dropſy there. For this Diſtemper I have found out a very innocent, but almoſt a certain effectual Remedy, which will alſo be an excellent Preſervative to the poor People, and therefore I will communicate it for the Good of the Publick, and ſpeedily I hope to give them one for the *Bellon* itſelf. But before I proceed, I think I am under a Neceſſity to explain the Nature of the Diſtemper, which every Body knows takes its Origin from the Lead.

Every Metal has its peculiar Poiſon; and this lies always hid in the *Terra Vitrificibilis*, becauſe the *Terra Merculialis* and *Phlogiſton* are in all Metals univerſally the ſame, and not in the leaſt of a pernicious or poiſonous Nature; but in the *Terra Vitrificibilis* of the Lead there is a moſt ſurprizing Poiſon, as every one will allow, that has either examined it, or ſeen its Effects; for it operates quite different to any other Poiſon the Mineral World produces, which is the Reaſon that the Phyſicians hitherto have been of Opinion that no Relief could be given to ſuch as were affected with *La Poudre de la Succeſſion* *, becauſe every Thing that has

* *La Poudre de la Succeſſion* is nothing more than a Preparation of Lead.

been

been to this Day tried, has been without any good Effect: But as for my Part I am convinc'd it's poſſible to expel this pernicious Poiſon, if it was but timely aſſiſted, and the common Emetick, Sudorifick, and purgative Regimens laid aſide, which are ſo far from doing any real Service, that they haſten the miſerable Patient to make his Exit. As for my Part, I would have them treated much after the ſame Manner as I am going to lay down for curing that Diſtemper which the common People here call the *Smoke*; but if I remain alive and well, as ſoon as I can find leiſure Time, I will communicate to the World what I by Experience have found a certain Antidote againſt *La Poudre de la Succeſſion.*

I have obſerved, that the Miners and Smelters themſelves, after they have been infected, and the pernicious Particles carried, according to the Laws of Circulation, up to the upper Belly, as it's there moſt commonly that it exerts its fatal Tragedy, and form'd there an Obſtruction, it has been too common a Practice amongſt the Phyſicians to attack the Enemy by Vomiting, Purging, and ſuch like violent Methods, in order, as they imagine, to expel it; but inſtead of that, they add to its miſchievous Effects. It is too faſt wedg'd upon the Conſtitution of ſome or other of the *Viſcera* to give Way either to the Efforts or Endeavours of Nature unaſſiſted, or to the Force communica-

ted to the Blood by the Stimuli of thoſe Medicines, ſo they only lay too great a Streſs upon Nature already too much oppreſs'd by the Diſtemper itſelf, and frequently increaſe the *Momentum* of the Fluids to ſuch a Degree, as to cauſe them to rupture the Veſſels; after which all Hopes of a Cure are loſt, and the poor Patient is left to the Rapine of a certain Death; and the Phyſician has the Mortification to ſee, if he is capable of ſeeing his Errors, by his violent Proceedings, a Complication of Diſorders brought on, which, to palliate, is all that he is able to do, and his poor Patient protracting and dragging on a miſerable Life; whereas, had he had Recourſe to moderate, gentle Attenuants to carry off the Poiſon by ſome opener Outlet, as the Secretion of the Urine, aſſiſted by frequent large Draughts of ſome proper diluting Liquor, the Cure would have been compleated: For which Reaſon it is, that I will ſpeedily ſet down a Remedy for the Benefit of the poor Miners and Smelters, after I have ſaid a few Words more concerning the Nature of this Poiſon, which I would recommend to them, not only to make uſe of in time of Neceſſity, when affected, but twice or thrice a Year alſo by way of a Preſervative.

The poiſonous Particles that inſinuate themſelves into the Bodies of thoſe Labouring People, are intermix'd with a great deal of groſs Earth, and other Parts quite different

to

to the Lead itſelf, as this Metal is ſeldom found alone, or pure, but generally blended with ſomething elſe; therefore it is that the Miners and Smelters are affected with more violent Symptoms, and conſequently hurried ſooner to their Period than thoſe that have taken *La Poudre de la Succeſſion*, which in all Parts of the World has occaſioned ſo much Speculation. The *Recipe* I have found of ſingle Uſe to ſuch as were affected with the *Smoke*, is as follows:

Take of the Leaves of Pellitory of the Wall four Handfuls; of Mint two Handfuls; of Carduus, Daiſy, Speedwell, Sage, and Camomile-Flowers, each a Handful; of Fox-Glove Leaves half a Handful.

Cut or bruiſe theſe in a Stone Mortar; then for eight or ten Hours let them infuſe by the Fire-ſide in two Gallons of boiling Water, in a Veſſel well ſtopp'd up, ſo that no Steam can evaporate. Of this Infuſion let the Perſon that is affected with the *Smoke*, take Half a Pint Morning and Evening, when the Stomach is empty; and when uſed by way of Preſervative, let a Quarter of a Pint be taken twice a Day for the Space of three Weeks together.

Give me leave, before I make an End, to deſire every one that practiſes Phyſick, to be cautious in adminiſtring Mercurials to ſuch Patients as I am ſpeaking of; for as Mercury will meet and mix with the *Terra Vitrificibilis Metallorum*, which they muſt of Neceſſity have contracted in the Smelting-

Houſes, ſo, conſequently, no real Good or Advantage can be expected from them; but I muſt confeſs ſhould not wonder to meet with fatal Conſequences enſuing from them.

A good Apothecary that will diſcharge his Duty right, prepare the Preſcriptions ſent him genuinely, and take Care that the Drugs are good, is a moſt valuable and neceſſary Member in a Republick: But, to my Sorrow, in *London* have obſerv'd Numbers of them commit unanſwerable Abuſes in this Reſpect, which ſome time ago cauſed me publickly to complain of them. But I muſt confeſs, that here Meſſrs. *Taylor*, *Totty*, and *Coyney* of *Holywell*, and Mr. *Blount* of *Golden-Grove*, ſubſtitute no Succedaneums, but cloſely ſtick to my Receipts, which makes my great Practice a Pleaſure to me: And to theſe worthy Gentlemen it is that I owe the Succeſs I have met with; as they have exceeding good Drugs, and take the greateſt Care to obſerve my Directions, by doing of which, they have gained Credit both for themſelves and me; but as to the reſt of the neighbouring Apothecaries I cannot ſay ſo much.

I have obſerved after printing *p.* 30, 31, that I have aſſerted, that *Terra Ferri* is the Matrix of White Ore, which, ſtrictly ſpeaking, is not; for a vitriolick Acid is, whoſe Matrix indeed is *Terra Ferri*, and which, I confeſs, is in a conſtant Generation; but then it is no Metal, being only a ſimple Liquid.

A LET-

A LETTER *to a Friend at* CHESTER, *in Anſwer to his Advice given me not to publiſh any thing againſt M.* HOOSON'S Miner's Dictionary.

SIR,

I Receiv'd your Compliments, for which, and your kind Enquiry after my Welfare, I am much obliged to you; and ſtill more ſo for your kind Advice, not to publiſh any thing againſt Mr. *Hooſon's* MINER'S DICTIONARY, as in that you have ſhewn yourſelf my Friend: But, pardon me, if I have not followed it; pardon me, if I flatter myſelf, that I have more Reaſon on my Side than you imagine. I confeſs, your Objections will bear a great Sway with every one that is not thoroughly acquainted with my Reaſons, and I doubt not but a great many of the ſenſible Part of the World are of your Opinion; upon which Account it is that I have choſe to anſwer them in this publick Manner.

You ſay, that Mr. *Hooſon* is but a practical Miner, not exceedingly well read, therefore not my Equal, and conſequently not worth my Notice. The major, I believe, I may grant, without ſubtracting from the Reputation of the Man, and the minor, likewiſe, without being thought too arrogant. However, I can but thank you for having

having entertain'd ſo good an Opinion of me, but I can't agree with you in drawing the Conſequence: I think it neceſſary to make known his Errors in this Part of the World, where Mining is but in its Infancy; for when the Shrine is in Danger, the Workmen claim their Croft. Add to this the following Reaſons:

Firſt, I muſt tell you, that I ſhould have been very glad to have taken ſome one for an Adverſary, that was my Equal; but you muſt allow, that in this Country that could not be done: The major Part of the higher Claſs of People apply themſelves not to the Study of the Art of Mining; they know nothing more of what belongs to it, than to raiſe exorbitant Farms, and inſtead of promoting it, clap ſome Obſtacle or other in the Way of thoſe that would take Leaſes, employ the poor Labourers that are ſtarving for want of Work, and do ſome Service to the Country at leaſt. But alas, the Publick Spirit they ſo much boaſt of, is nothing elſe but a Flaſh of falſe unnatural Spirits, rais'd from the ſtrong Liquors they ſo much uſe, the Effects of which, when over, *Catonians* they are no more.

Secondly, notwithſtanding Mr. *Hooſon* is but a Novice in Mining, yet in this Part of the World he is the Oracle: Nay, what is more, his Diſciples have over-run the whole Country, and ſuch as will not agree with them are laugh'd and ſneer'd out of Reaſon,

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if poſſible, in order that their Patrons may not be inform'd of the Truth, but ſtill kept in Ignorance to their no ſmall Advantage, I grant you, but to the greateſt Detriment of their Eſpouſers imaginable; therefore I thought it high Time to go to Work, to admoniſh them of ſuch Proceeding, and raiſe up amongſt the thinking Part of Mankind ſome Reflection of the Loſſes they ſuſtain, by being ruled by ſuch Empiricks. I Confeſs, I ſtay'd not to reflect who it was that I made my Antagoniſt; I only took a curſory View of the Evils which I foreſaw would accrue from his Book; when that natural Charity, that every private Perſon owes to the Publick, prompted me to do what I did, and I heartily wiſh that my Endeavours may meet with the deſir'd Effect, and do that real Service I ſincerely intended they ſhould. But I did not foreſee them only, I beforehand had Proof of them; I've ſeen here two Miners in particular, making no ſmall Figure with Mr. *Hooſon*'s Inſtructions, amongſt Gentlemen that were not in the leaſt acquainted with the Art of Mining; they gloried how they had learnt it under him, and boaſted they had been his Pupils; by this Means they inſinuated themſelves into Favour, gained great Credit, and attained conſiderable Employments; and this I am afraid has, and will be more often the Caſe, unleſs ſome more able Genius can be perſuaded to apply to the Study of the Mineral World; and

that this is my only Aim is evident, as it's impoſſible I ſhould have any thing elſe in View; for I could neither be induc'd to it by Ambition or Intereſt, Envy or Malice: For had Ambition been my Motive, I ſhould not have fallen upon a poor Miner's Book. I might (had I been ſet upon Writing) pick'd out ſome other Subject, that would have better ſuited my Capacity; been more entertaining to the Minds of other People, and in handling of which, might have ſhewn a greater Sketch of Learning. Envy neither can I have, as I deſire to be employ'd by no one; and from Intereſt and Malice Mr *Hooſon* himſelf, I believe, though I have never ſeen him, yet will clear me.

I am Yours,

With the utmoſt Sincerity,

D. W. Linden.

F I N I S.

E R R A T A.

Page 3, Line 3, for *for*, read of.—p. 11, l. 4, for *Craſſus*, read Croeſſus.—p. 12, l. 9, for *Citharedi*, r. Citharædi.—p. 16. l. 26. for *Phyſice*, r. Phyſicæ.—p. 17. l. 3. for *ea*, r. ex. Ibid, l. 12. for *Lamellorum*, r. Lamellarum.—p. 30. l. 4. for *you*, r. they. Ib. 19. for *Sulpher*, r. Sulphur.—p. 31. l. 7. for *Inteſtines*, r. Interſtices.—p. 34, l. 23. for *from*, r. by.—p. 37. l. 23. for *your*, r. the.—p. 44. l. 14. before been ſucceſsful, add *that*.—p. 61. l. 18. for *Caſes*, r. Caſe. p. 63. in the Note, l. 9. for *Spicula*, r. Spiculæ.—p. 64. l. 18. for *Mercurialis*, read Mercurialis.